

# Proof of extended derivation relations for multiple zeta values

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A large class of relations for multiple zeta values called the derivation relations was proved by K. Ihara, M. Kaneko and D. Zagier. They also suggested a possible extension of the derivation relations and Kaneko recently formulated it explicitly as a conjecture.

In this talk, we give a proof of the conjecture by reducing it to a class of relations studied by G. Kawashima. On the way, we find some algebraic properties of the extended derivation operator “ $\partial_n^{(c)}$ ” ( $n \geq 1, c \in \mathbb{Q}$ ) on the non-commutative polynomial ring  $\mathbb{Q}\langle x, y \rangle$ , which has been devised by modeling a Hopf algebra developed by A. Connes and H. Moscovici.